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10/759,080	01/20/2004	William Gobush	20002.0313	7157

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EXAMINER	
LEUNG, JENNIFER	
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3709	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	12/29/2006	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,080	GOBUSH, WILLIAM	
	Examiner	Art Unit	
	Jennifer Leung	3709	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 January 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/17/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: 2 (page 7, line 24). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

2. The drawings are objected to under 37 CFR 1.83(a) because they fail to show field 35 as described in the specification on page 14, line 13 and page 15, line 25. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if

only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

1. The disclosure is objected to because of the following informalities:

Page 3, line 3: "calibration fixture" should be -- calibration attachment --.

Page 4, line 15: "contrasting images" should be -- contrasting areas --.

Page 5, line 6: "images one" should be -- images of one --.

Page 5, lines 12-19: "calibration fixture" should be -- calibration attachment --.

Page 5, line 15: "selected to that" should be -- selected so that --.

Page 7, line 19: "line 1" should be -- line L --.

Page 7, line 23: "rising attack angle U" should be -- rising attack angle V --.

Page 10, lines 1-2: "calibration fixture" should be -- calibration attachment --.

Page 10, line 18: "7h" is missing the name of the part.

Page 11, line 1: "clubs face 7a" should be -- club face 7f --.

Page 12, line 28: "coordinates each" should be -- coordinates of each --.

Page 13, lines 13-14: "mult-marker" should be -- multi-marker --.

Page 14, line 14: "panel 18a" should be -- panel 18p --.

Page 15, line 23: "may teed" should be -- may be teed --.

Page 16, line 23: "the camera viewing the area" should be -- the camera viewing area -.

Page 17, line 3: "fixture" should be -- attachment --.

Page 17, line 4: "two position of" should be -- two positions of --.

Page 17, line 8: the subscript of the 3rd variable V should be a "z".

Appropriate correction is required.

Claim Objections

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 8-34 have been renumbered 9-35.

3. Claim 24 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim limitation "shuttering or gating at least three times" in lines 1-2 fails to further limit the claim limitation "shuttering or gating at least two times" in claim 1, line 5.

4. Claims 1-7, 9, 11, 14, 22, 23, 25, 28, 31-33, and 35 are objected to because of the following informalities:

Claim 1, line 1: "the movement" should be -- a movement --.

Claim 1, line 8: "said areas" should be -- said contrasting areas --.

Claim 1, lines 10-11: "the camera shutters" should be -- camera shutters--.

Claim 1, line 13: "the conditions of the path" should be -- conditions of a path --.

Claim 1, line 14: "the instrument through the field" should be -- the striking instrument through a field --.

Claim 1, lines 16-17: "the position" should be -- a position --.

Claim 2, lines 1-2: "the spatial location" should be -- a spatial location --.

Claim 2, line 2: "the geometric center" should be -- a geometric center --.

Claim 3, line 1: "the body coordinates" should be -- body coordinates --.

Claim 4, line 2: "the spatial locations" should be -- spatial locations --.

Claim 5, line 2: "the three-dimensional positions" should be -- three-dimensional positions --.

Claim 5, line 3: There should be a period at the end of the claim.

Claim 6, line 3: "the position" should be -- a position --.

Claim 7, line 2: There should be only one period at the end of a claim.

Claim 9, line 2: "the instrument and object" should be -- the striking instrument and the object --.

Claim 11, line 1: "the instrument" should be -- the striking instrument --.

Claim 11, line 3: "the club head path" should be -- a club head path --.

Claim 11, line 3: "the club" should be -- the golf club --.

Claim 14, lines 1-2: "the location" should be -- a location --.

Claim 22, lines 1-2: "the club head velocity" should be -- a club head velocity --.

Claim 23, lines 1-2: "determining club head velocity" should be -- determining the club head velocity --.

Claim 25, lines 1-2: "the single camera" should be -- the single camera unit --.

Claim 28, line 1: "the movement" should be -- a movement --.

Claim 28, line 5: " a striking instrument" should be -- the striking instrument --.

Claim 28, line 7: "contrasting images" should be -- contrasting areas --.

Claim 28, line 11: "contrasting area" should be -- contrasting areas --.

Claim 31, line 3: "the camera" should be -- the single camera unit --.

Claim 32, lines 6-7: "contrasting area" should be -- contrasting areas --.

Claim 33, lines 1-3: "the global coordinate system" should be -- the three-dimensional global coordinate system --.

Claim 35, line 3: "wherein the three-dimensional positions" should be -- wherein three-dimensional positions --.

Claim 35, line 9: "strking face" should be -- striking face --.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 6, 7, 8, 28, and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claims 6 and 35: the claims recite the limitation "the calibration fixture" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. It is suggested to be -- the calibration attachment --.

Re claims 7 and 8: In line 3, "when it is" should be -- when the striking instrument is -- because the use of the pronoun, "it", renders the claim vague and indefinite.

Re claim 28: In line 15, "to determine their three-dimensional positions" should be -- to determine three-dimensional positions of the first plurality of contrasting areas -- because the use of the pronoun, "their", renders the claim vague and indefinite.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 9-14, 17, 18, 21, and 24-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Gobush '367 (US 2002/0173367).

Re claim 1: Gobush '367 discloses a single-camera system for monitoring the movement of a striking instrument that impacts with an object (para. 0074, lines 2-7) comprising: (a) a single camera unit (para. 0074, lines 2-7; para. 0076, line 2) having a light sensitive panel (para. 0035, lines 1-3) that is capable of being focused on a field of view through which the striking instrument passes prior to striking the object (para. 0015, lines 2-10; para. 0017, lines 1-5), wherein said single camera unit is capable of shuttering or gating at least two times as the striking instrument and object pass through the field of view (para. 0017, lines 5-7; para. 0031, lines 14-16); (b) three or more contrasting areas on the striking instrument (para. 0003, lines 3-7; para. 0067, lines 14-15) and one or more contrasting areas on the object (para. 0067, lines 4-12), said areas

positioned so that light emitting therefrom reaches said light sensitive panels to form images thereon and create image signals when the camera shutters are open (para. 0003, lines 3-5; para. 0010, lines 6-7; para. 0067, lines 20-22); (c) an image analyzer capable of discriminating between the striking instrument contrasting areas and the object contrasting areas (para. 0002, lines 1-3; para. 0017, lines 7-10; para. 0064) and determining the conditions of the path and orientation of the instrument through the field (para. 0029, lines 3-9; para. 0099, lines 3-7); and (d) wherein the striking instrument has a striking face (Figs. 5 & 14: part of the golf club that hits the ball), and wherein the striking instrument is calibrated (para. 0083) such that the single-camera system is capable of identifying the position and orientation of the striking face from the striking instrument contrasting areas (para. 0003, lines 1-7; para. 0099, lines 1-7).

Re claim 4: Gobush '367 further discloses the system of claim 1, wherein the striking instrument is calibrated with a priori knowledge of the spatial locations of the striking instrument contrasting areas (para. 0067, lines 14-20).

Re claim 9: Gobush '367 further discloses the system of claim 1, further comprising an electronic light source that emits light in two flashes onto the instrument and object (para. 0050, lines 3-6; para. 0075, lines 1-4).

Re claim 10: Gobush '367 further discloses the system of claim 1, wherein the striking instrument has four contrasting areas and the object has six contrasting areas (para.0066; claim 18, lines 6-8).

Re claim 11: Gobush '367 further discloses the system of claim 1, wherein the instrument is a golf club (claim 27) comprising a club head and a club face (Fig. 5; Fig. 14) wherein the object is a golf ball (Fig. 4; Fig. 9; Fig. 14; claim 27), and wherein the image analyzer is capable of determining the club head path and face orientation during a swing of the club (para. 0029, lines 3-9; para. 0099, lines 3-7).

Re claim 12: Gobush '367 further discloses the system of claim 11, wherein the golf club is a golf club driver or iron (para. 0085, lines 15-18: it is well known in the art, that there are different types of golf clubs, including drivers, irons and putters).

Re claim 13: Gobush '367 further discloses the system of claim 11, wherein the golf club is a putter (para. 0085, lines 15-18: it is well known in the art, that there are different types of golf clubs, including drivers, irons and putters).

Re claim 14: Gobush '367 further discloses the system of claim 11, wherein the image analyzer is capable of determining the location of impact of the golf ball on the club face (para. 0099, lines 3-7).

Re claim 17: Gobush '367 further discloses the system of claim 14, wherein the accuracy of the image analyzer for determining the golf ball impact location is comparable to the accuracy of a 2-camera system (para. 0004; para. 0005, lines 8-10; para. 0029, lines 1-3; para. 0074, lines 1-7; para. 0076; para. 0087, lines 1-6).

Re claim 18: Gobush '367 further discloses the system of claim 11, wherein the image analyzer is capable of determining one or more of a droop angle, a loft angle, a face angle, a path angle, or an attack angle of the golf club (para. 0099, lines 3-7).

Re claim 21: Gobush '367 further discloses the system of claim 18, wherein the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle is comparable to the accuracy of a 2-camera system (para. 0004; para. 0005, lines 8-10; para. 0029, lines 1-3; para. 0074, lines 1-7; para. 0076; para. 0087, lines 1-6).

Re claim 24: Gobush '367 further discloses the system of claim 1, wherein the single camera unit is capable of shuttering or gating at least three times as the striking instrument and object pass through the field of view (para. 0017, lines 5-7; para. 0031, lines 1-7).

Re claim 25: Gobush '367 further discloses a triggering unit for determining when the single camera captures an image of the striking instrument and object (para. 0031, lines 1-4).

Re claim 26: Gobush '367 further discloses the system of claim 25, wherein the triggering unit comprises a light source, a reflector, and an optical sensor (para. 0003, lines 6-7; para. 0005, lines 14-18; para. 0033, lines 1-7).

Re claim 27: Gobush '367 further discloses the system of claim 25, wherein the triggering unit comprises an ultrasonic (para. 0032, lines 7-8; para. 0033, line 1: ultrasonic uses acoustic frequencies) emitter (para. 0031, line 3) and receiver (para. 0031, lines 1-2).

Re claim 28: Gobush '367 discloses a method of monitoring the movement of a striking instrument that impacts with an object (para. 0074, lines 2-7) comprising the steps of: (a) providing a single camera unit (para. 0074, lines 2-7; para. 0076, line 2) having a light sensitive panel (para. 0035, lines 1-3) that is capable of being focused on a first field of view (para. 0015, lines 2-10; para. 0017, lines 1-5); (b) placing a striking instrument having a first plurality of contrasting areas (para. 0003, lines 3-7; para. 0067, lines 14-15) within the first field of view of the single camera unit to provide a first perspective view of the striking instrument and first plurality of contrasting images (A, Fig. 14; claim 28, lines 1-9); (c) capturing a first image of the first perspective view of the

striking instrument and first plurality of contrasting areas (Figs. 12-13; claim 28, line 10); (d) providing a second perspective view of the striking instrument and first plurality of contrasting area (B, Fig. 14); (e) capturing a second image of the second perspective view of the striking instrument and first plurality of contrasting areas (Figs. 12-13); (f) analyzing the first plurality of contrasting areas in the first and second images of the striking instrument to determine their three-dimensional positions (para. 0017, lines 7-9; para. 0028; para. 0029, lines 6-9; claim 28, lines 11-13).

Re claim 29: Gobush '367 further discloses the method of claim 28, wherein the first perspective view of the striking instrument and first plurality of contrasting areas differs from the second perspective view of the striking instrument and first plurality of contrasting areas from about 5 to about 10 degrees (para. 0038, lines 5-9).

Re claim 30: Gobush '367 further discloses the method of claim 29, wherein the step of providing a second perspective view of the striking instrument and first plurality of contrasting areas comprises repositioning the striking instrument (para. 0028; Fig. 14: to move from position A, which is the first perspective view to position B, which is the second perspective view, the club must be repositioned).

Re claim 31: Gobush '367 further discloses the method of claim 30, wherein the step of providing a second perspective view of the striking instrument and first plurality of

contrasting areas further comprises maintaining the first field of view of the camera (para. 0017, lines 5-6).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '896 (US 2002/0155896). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the striking instrument, which is calibrated such that the spatial location of the contrasting areas are known relative to the geometric center of the striking face.

Gobush '896 teaches the striking instrument, which is calibrated such that the location of the contrasting areas (markers) are known relative to the center of the striking face (para. 0100).

Therefore, in view of Gobush '896, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calibrate the striking instrument such that the location of the contrasting areas are known relative to the center of the

striking face in order to obtain a more accurate measurement of the striking instrument's swing characteristics.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '896 (US 2002/0155896). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the striking instrument, which is calibrated such that the body coordinates of the striking instrument are known relative to the striking instrument contrasting areas.

Gobush '896 teaches the striking instrument, which is calibrated such that the coordinates of the striking instrument are known (para. 0099, lines 1-2) relative to the striking instrument contrasting areas (para. 0100, lines 1-6).

Therefore, in view of Gobush '896, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calibrate the striking instrument such that the coordinates of the striking instrument are known relative to the striking instrument contrasting areas in order to obtain a more accurate measurement of the striking instrument's swing characteristics.

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '896 (US 2002/0155896). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose a calibration fixture having a plurality of contrasting areas, wherein the three-dimensional positions of the calibration fixture contrasting areas are known relative to each other.

Gobush '896 teaches a calibration fixture having a plurality of contrasting areas (para. 0086, lines 14-24), wherein the three-dimensional positions of the calibration fixture contrasting areas are known relative to each other (para. 0086, lines 24-27).

Therefore, in view of Gobush '896, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a calibration fixture having a plurality of contrasting areas, wherein the three-dimensional positions of the calibration fixture contrasting areas are known relative to each other, in order to obtain a more accurate measurement of the striking instrument's swing characteristics.

7. Claim 6, as understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose a calibration attachment having a plurality of contrasting areas, wherein the calibration attachment is capable of being disposed on the striking face, and wherein the position of at least one contrasting area of the calibration attachment is known relative to the striking face when the calibration attachment is disposed on the striking face.

Gobush '719 teaches a calibration attachment (32, Fig. 7) having a plurality of contrasting areas (31a-31c, Fig. 7), wherein the calibration attachment is capable of

being disposed on the striking face (32, 7f, Fig. 7), and wherein the position of at least one contrasting area of the calibration attachment is known relative to the striking face when the calibration attachment is disposed on the striking face (col. 4, lines 5-28).

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include a calibration attachment having a plurality of contrasting areas, wherein the calibration attachment is capable of being disposed on the striking face, and wherein the position of at least one contrasting area of the calibration attachment is known relative to the striking face when the calibration attachment is disposed on the striking face, in order to obtain a more accurate measurement of the striking instrument's swing characteristics.

8. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the single camera unit configured to capture at least one image of the striking instrument when it is within about 2 inches or less from the object. Gobush '367 also fails to disclose the single camera unit configured to capture at least one image of the striking instrument when it is within about 1 inch or less from the object.

Gobush '719 teaches the single camera unit configured to capture at least one image of the striking instrument when it is within the object (Fig. 5; col. 5, lines 1-15; col. 5, lines 35-37: it doesn't matter how many inches the club is away from the ball, as long

as the club and ball are within the camera's view, the cameras are capturing the electronic images).

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to configure the single camera unit to capture at least one image of the striking instrument when it is within the object within camera view in order to obtain a more accurate measurement of the striking instrument's swing characteristics.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the accuracy of the image analyzer for determining the golf ball impact location within 0.25 inch.

Gobush '719 teaches the accuracy of the image analyzer for determining the golf ball impact location within 0.25 inch (col. 7, 1st table, 7th "Type of Measurement" under col. "Standard Deviation").

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an accuracy of the image analyzer for determining the golf ball impact location within 0.25 inch in order to obtain a more accurate measurement of the golf ball impact location.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367, as modified by Gobush '719, as applied to claim 15 above, and further in view of Reda (US 6,371,862). The teachings of Gobush '367 modified by Gobush '719 have been discussed above.

However, the teachings of Gobush '367 modified by Gobush '719 fails to disclose the accuracy of the image analyzer for determining the golf ball impact location within 0.10 inch.

Reda teaches the accuracy of the image analyzer for determining the golf ball impact location within 0.10 inch (Figs. 3 & 4; col. 5, lines 29-35).

Therefore, in view of Reda, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an accuracy of the image analyzer for determining the golf ball impact location within 0.10 inch in order to obtain a more accurate measurement of the golf ball impact location.

11. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle within 3 degrees. Gobush '367 also fails to disclose the accuracy of the image analyzer for determining the golf club droop angle, loft angle, face angle, path angle, or attack angle within 1 degree.

Gobush '719 teaches the accuracy of the image analyzer for determining the path angle within 1 degree (col. 7, 1st table, row 9 under col. "Standard Deviation").

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an accuracy of the image analyzer for determining the path angle within 1 degree in order to obtain a more accurate measurement of the path angle.

12. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). Gobush '367 further discloses the accuracy of the image analyzer for determining club head velocity (para. 0099, lines 3-7) comparable to the accuracy of a 2-camera system (para. 0004; para. 0005, lines 8-10; para. 0029, lines 1-3; para. 0074, lines 1-7; para. 0076; para. 0087, lines 1-6).

However, Gobush '367 fails to disclose the image analyzer capable of determining the club head velocity with an accuracy within 20 feet per second.

Gobush '719 teaches the accuracy of the image analyzer for determining the image analyzer capable of determining the club head velocity with an accuracy within 20 feet per second (col. 7, 1st table, rows 1-3 under col. "Standard Deviation").

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have the image analyzer capable of determining the club head velocity with an accuracy within 20 feet per second in order to obtain a more accurate measurement of the club head velocity.

13. Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367, as modified by Gobush '896, as applied to claim 5 above, and further in view of Gobush '719 (US 5,575,719). Gobush '896 further discloses the steps of capturing the first image of the first perspective view of the striking instrument and capturing the first image of the first perspective view of the calibration fixture at the same time (para. 0075, lines 11-16).

However, the teachings of Gobush '367 modified by Gobush '896 fails to disclose the step of analyzing the second plurality of contrasting areas in the first and second images of the calibration fixture to create a three-dimensional global coordinate system.

In addition, the teachings of Gobush '367 modified by Gobush '896 fails to disclose a first axis of the global coordinate system parallel to gravity, a second axis of the global coordinate system directed toward a target, and a third axis of the global coordinate system orthogonal to the first and second axes.

Gobush '719 teaches the step of analyzing the second plurality of contrasting areas in the first and second images of the calibration fixture to create a three-dimensional global coordinate system (col. 3, lines 60-61).

Gobush '719 also teaches a first axis of the coordinate system parallel to gravity, a second axis of the coordinate system directed toward a target, and a third axis of the coordinate system orthogonal to the first and second axes (Fig.7; col. 4, lines 11-19: the x-axis is parallel to gravity, the direction normal to the clubface is directed toward the target, and the y-axis is orthogonal to the 1st and 2nd axes).

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the step of analyzing the second plurality of contrasting areas in the first and second images of the calibration fixture to create a three-dimensional global coordinate system, a first axis of the coordinate system parallel to gravity, a second axis of the coordinate system directed toward a target, and a third axis of the coordinate system orthogonal to the first and second axes, in order to calibrate and improve the accuracy of the single camera system.

14. Claim 35, as understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Gobush '367 in view of Gobush '719 (US 5,575,719). The teachings of Gobush '367 have been discussed above.

However, Gobush '367 fails to disclose the steps of: providing a calibration attachment having a third plurality of contrasting areas, wherein the three-dimensional positions of the third plurality of contrasting areas on the calibration attachment are known relative to each other; placing the calibration attachment on a striking face of the striking instrument so that the first and second captured images of the first and second perspective views of the striking instrument and first plurality of contrasting areas further comprise images of the third plurality of contrasting areas; and removing the calibration attachment from the striking face.

Gobush '719 teaches the steps of: providing a calibration attachment (32, Fig. 7) having a third plurality of contrasting areas (31a-31c, Fig. 7), wherein the three-

dimensional positions of the third plurality of contrasting areas on the calibration attachment are known relative to each other (col. 4, lines 5-28); placing the calibration attachment on a striking face of the striking instrument so that the first and second captured images of the first and second perspective views of the striking instrument and first plurality of contrasting areas further comprise images of the third plurality of contrasting areas (col. 3, lines 66-67; col. 4, lines 19-21); and removing the calibration attachment from the striking face (col. 4, lines 27-28).

Therefore, in view of Gobush '719, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include the steps of: providing a calibration attachment having a third plurality of contrasting areas, wherein the three-dimensional positions of the third plurality of contrasting areas on the calibration attachment are known relative to each other; placing the calibration attachment on a striking face of the striking instrument so that the first and second captured images of the first and second perspective views of the striking instrument and first plurality of contrasting areas further comprise images of the third plurality of contrasting areas; and removing the calibration attachment from the striking face, in order to calibrate the striking face and improve the accuracy of the single camera system.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McNitt discloses a method and system for physical motion

analysis and training of a golf club swing motion using image analysis techniques. Baldwin discloses an automatic indexing of indexible tee for automatic lie selection. Nauck discloses a golf shot tracking and analysis system. Baker discloses a personalized instructional aid. Bair discloses a golf simulator. Hart discloses a golf swing analysis system and method. Chamberlain discloses a golf simulator. Evensen discloses a repetitive motion feedback system and method of practicing a repetitive motion.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer Leung whose telephone number is 571-270-1342. The examiner can normally be reached on Mon -Thur, every other Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jong-Suk (James) Lee can be reached on 571-272-7044. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Jennifer Leung
December 14, 2006

KIM NGUYEN
PRIMARY EXAMINER